

## WHAT IS CLAIMED IS:

1. An interference wave detecting device comprising:  
transmitting means for converting data to be transmitted  
5 from a base station into a radio signal of a predetermined  
transmission frequency, and for transmitting said radio signal  
to a mobile station;

receiving means for receiving either of a radio signal  
lying within a certain reception band of frequencies including  
10 a predetermined reception frequency from said mobile station  
and an interference wave signal lying within a certain  
transmission band of frequencies including said predetermined  
transmission frequency; and

controlling means for causing said transmitting means to  
15 stop transmitting said radio signal of said predetermined  
transmission frequency in order to detect said interference  
wave signal, and for enabling said receiving means to receive  
said interference wave signal only within a period of time  
during which said transmitting means stops transmitting said  
20 radio signal of said predetermined transmission frequency to  
said mobile station.

2. The interference wave detecting device according to  
Claim 1, wherein when said receiving means has received and  
25 detected said interference wave signal having a frequency equal  
to said predetermined transmission frequency, said controlling  
means makes a request to change said predetermined transmission  
frequency to another transmission frequency, and wherein when  
said receiving means has received and detected said  
30 interference wave signal lying within said transmission band

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6. The interference wave detecting device according to  
30 Claim 5, further comprising a plurality of synthesizers,

wherein said control means causes said receiving means to change said predetermined reception frequency to another transmission frequency by switching among said plurality of synthesizers.

5           7. The interference wave detecting device according to Claim 1, wherein in order to detect an interference wave signal having the same frequency as said radio signal being transmitted thereto by said mobile station, said controlling means recognizes, as said interference wave signal, said radio signal  
10 received by said receiving means within a period of time during which one or more continuous null time slots of said radio signal are being received.

15           8. The interference wave detecting device according to Claim 1, wherein in order to detect an interference wave signal lying within a certain reception band of frequencies, but having a frequency different from that of said radio signal being transmitted thereto by said mobile station, said controlling means causes said receiving means to tune from said  
20 predetermined reception frequency to a different reception frequency within a period of time during which one or more continuous null time slots of said radio signal are being transmitted by said transmitting means, and recognizes, as said interference wave signal, said radio signal received by said  
25 receiving means within a period of time during which one or more continuous null time slots of said radio signal are being received, after said receiving means has changed said predetermined reception frequency.

30           9. The interference wave detecting device according to

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Claim 1, wherein said controlling means causes said transmitting means to transmit a radio signal including test data, and, when said receiving means receives said radio signal, compares said test data included in said radio signal transmitted by said transmitting means with test data included in said received radio signal.

10. An interference wave detecting device comprising:  
transmitting means for converting data to be transmitted from a base station into a radio signal of a predetermined transmission frequency, and for transmitting said radio signal to a mobile station;

a first receiving antenna for receiving a signal lying within a certain reception band of frequencies including a predetermined reception frequency from said mobile station;

first high-frequency amplifying means for amplifying said signal received by said first receiving antenna and for allowing only those signal components within the amplified signal to pass which are within a limited range of frequencies;

a second receiving antenna for receiving another signal lying within a certain transmission band of frequencies including a predetermined transmission frequency;

second high-frequency amplifying means for amplifying said other signal received by said second receiving antenna and for allowing only those signal components within the amplified other signal to pass which are within a limited range of frequencies;

first local oscillating means for generating a first local oscillating signal;

second local oscillating means for generating a second

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local oscillating signal of a frequency equal to the difference between said predetermined transmission frequency and said predetermined reception frequency;

5 mixing means for mixing said other signal amplified by said second high-frequency amplifying means and said second local oscillating signal so as to convert said amplified other signal into an output signal of said predetermined reception frequency;

10 selecting means for selecting either said output signal from said mixing means or said signal of said predetermined reception frequency amplified by said first high-frequency amplifying means, and for furnishing the selected signal;

15 reception level detecting means for converting said selected signal from said selecting means into an intermediate frequency or IF signal using said first local oscillating signal from said first local oscillating means, and for detecting the level of said selected signal; and

20 controlling means for causing said transmitting means to stop transmitting said radio signal and for causing said selecting means to select said output signal of said predetermined reception frequency from said mixing means in order to receive and detect an interference wave signal lying within said transmission band of frequencies.

25 11. The interference wave detecting device according to Claim <sup>10</sup> 1, wherein said first local oscillating means includes two local oscillators for generating two local oscillating signals of different frequencies, and wherein said interference wave detecting device further comprises second selecting means  
30 for selectively furnishing either of said two local oscillating

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signals as said first local oscillating signal to said reception level detecting means according to whether or not to detect an interference wave signal of a frequency equal to said predetermined transmission frequency.

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12. A method of detecting interference waves, comprising the steps of:

converting data to be transmitted from a base station into a radio signal of a predetermined transmission frequency, and transmitting said radio signal to a mobile station;

receiving a radio signal lying within a certain reception band of frequencies including a predetermined reception frequency from said mobile station; and

in order to detect an interference wave signal lying within a certain transmission band of frequencies including said predetermined transmission frequency, stopping the transmission of said radio signal of the predetermined transmission frequency to said mobile station and receiving said interference wave signal.

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13. The interference wave detecting method according to Claim 12, further comprising the steps of, when said interference wave signal having a frequency equal to said predetermined transmission frequency has been detected, making a request to change said predetermined transmission frequency to another transmission frequency, and, when said interference wave signal lying within said transmission band of frequencies, but having a frequency different from said predetermined transmission frequency has been detected, furnishing a notify signal indicating the detection of the interference wave

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signal.

14. The interference wave detecting method according to Claim 12, wherein in said stopping step, the transmission of said radio signal of said predetermined transmission frequency to said mobile station is stopped only when one or more continuous null time slots of said radio signal are being transmitted to said mobile station.

15. The interference wave detecting method according to Claim 14, further comprising the step of enabling said receiving step of receiving said interference wave signal only when one or more continuous null time slots of said radio signal is being transmitted from said base station.

16. The interference wave detecting method according to Claim 14, further comprising the step of, in order to detect an interference wave signal lying within said transmission band of frequencies, but having a frequency different from said predetermined transmission frequency of said radio signal being transmitted to said mobile station, changing said predetermined reception frequency to a different frequency so as to detect said interference wave signal having a frequency which is different from said predetermined transmission frequency.

17. The interference wave detecting method according to Claim 16, further comprising the steps of providing a plurality of synthesizers, and changing said predetermined reception frequency by switching among said plurality of synthesizers.

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18. The interference wave detecting method according to Claim 12, further comprising the step of, in order to detect an interference wave signal of a frequency equal to said predetermined reception frequency, recognizing, as said interference wave signal, said radio signal received within a period of time during which one or more continuous null time slots of said radio signal are being received.

19. The interference wave detecting method according to Claim 12, further comprising the steps of, in order to detect an interference wave signal lying within a certain reception band of frequencies, but having a frequency different from that of said radio signal being transmitted by said mobile station, changing said predetermined reception frequency to a different frequency within a period of time during which one or more continuous null time slots of said radio signal are being transmitted to said mobile station, and recognizing, as said interference wave signal, said radio signal received within a period of time during which one or more continuous null time slots of said radio signal are being received, after said predetermined reception frequency has been changed.

20. The interference wave detecting method according to Claim 12, further comprising the steps of transmitting a radio signal including test data, and, upon receipt of said radio signal, comparing said test data included in said radio signal transmitted in said transmitting step with test data included in said received radio signal.

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